

TEMPLATE "C-2"
GENERAL CONTRACTOR-TECHNICAL

STATEMENT OF WORK

Requisition #: 268143

Title: Spent/Failed LAW Melter Transport System Evaluation

Revision Number: 0

Date: June 9, 2014

Prior SOW or Revision Date: N/A

1.0 Objective

This Statement of Work (SOW) defines the tasks to be performed in evaluating the transport of spent/failed Low Activity Waste (LAW) melters from the Waste Treatment and Immobilization Plant (WTP) to the Integrated Disposal Facility (IDF) for disposal. The tasks include evaluating the loading and unloading interfaces, developing transporter requirements and description of any required equipment, evaluating alternative transportation routes, and defining the most efficient methodologies for the spent/failed LAW melter transportation system.

This SOW is for the performance of an evaluation and documentation of the evaluation only and does not include nor guarantee the subcontractor any future work that may be associated with spent/failed melter transportation.

2.0 Background/Introduction

As a result of processing waste through the LAW melter system, up to 18 LAW melters will require disposal over the mission of the Hanford WTP. The LAW melters are classified as mixed low-level radioactive waste (MLLW) and will be disposed of in the Integrated Disposal Facility.

In January of 2000, DOE and representatives from British Nuclear Fuels Limited, Inc. (BNFI) and the Tank Operations Contractor (TOC) met in a three day workshop to define the basis for melter disposal. Following the workshop, a Melter Disposal Strategic Planning Document, RPP-7094 was issued that looked at four options for transporting the spent/failed melters from the WTP to the IDF, including utilization of the existing Goldhofer submarine reactor compartment transporter. The current technical basis for melter transporter design is the Goldhofer transporter (DOE Transporter Vendor Drawing Transporter Documentation, CCN 016826C, dated 5 December 2000).

Since 2000, specific information regarding the LAW melter design, including physical parameters, has been provided to the TOC. The purpose of this evaluation report is to complete an updated study of the transportation options and efficiencies as well as evaluate the interfaces at the WTP associated with loading and at the IDF associated with off-loading based on current information.

The LAW melter physical parameters are:

Melter Type	Height	Length	Width	Melter Weight (Empty)	Melter Weight (Full of glass)
LAW	190-in	262-in	367-in	656,700 lbs.	698,500 lbs.

It is yet to be determined if spent/failed LAW melters will be required to be void filled before disposal. WTP has verified that the LAW melter assembly totally filled with grout weighing up to 500 tons can be safely lifted utilizing the base lifting eyes with the proper lifting equipment.

In order to bound the potential void fill case, the range of spent/failed LAW melter weights to be covered in this evaluation is from 350 to 500 tons. The overall dimensions are defined above. More detail on the LAW melter physical parameters and design will be made available to the Subcontractor during performance of this work. See Section 13, Special Requirements, Non-Disclosure Agreement.

The interface between TOC and WTP will be at the WTP's specified location of the transporter for the loading of spent/failed LAW melters by WTP. The interface between TOC and the IDF Contractor (Plateau Remediation Contractor currently) will be at a specified range of transporter positions for off-loading at the IDF. The following interface points are currently defined:

The WTP Contractor will:

- Load the spent/failed LAW melters onto TOC transport vehicles and provide documentation as requested by TOC to support transportation.
- Review TOC transport system loading procedures and equipment descriptions to ensure compatibility with WTP procedures and equipment.

The TOC Contractor will:

- Provide transport vehicles to move spent/failed LAW melters on a basis to support WTP Contractor's production schedule.
- Provide LAW melters Transport system loading procedures and equipment descriptions for WTP Contractor review.
- Provide LAW melters Transport system unloading procedures and equipment descriptions for IDF Contractor review.

The IDF Contractor will:

- Unload all WTP Contractor spent/failed LAW melters delivered by TOC for storage or disposal.
- Review TOC Transport system unloading procedures and equipment descriptions to ensure compatibility with IDF procedures and equipment.

WTP/TOC Interface

The physical interface point for the melter transport by TOC will be at the LAW (Building 20) vitrification facility. The WTP Contractor will provide site, facilities, and loading equipment capable of interfacing with the TOC-provided transporter.

3.0 Scope

The Subcontractor shall evaluate the transport of spent/failed LAW melters from the WTP to the IDF for disposal. The evaluation shall address the loading and unloading interfaces, transporter requirements and description of any required equipment, alternative transportation routes, and the most efficient methodologies for the spent/failed LAW melter transportation system.

WTP site general arrangement drawings show the location of the LAW vitrification facility in relation to the site access gate. A WTP transportation analysis had previously defined the site access and egress routes for the LAW melter transporter based on the Goldhofer submarine reactor compartment transporter. The evaluation should consider alternative transporter designs to determine if the Goldhofer transporter parameters bound the requirements for the LAW melter transporter access and egress accessibility. The evaluation must address key parameters of the transporter that would impact road or facility design, including:

1. minimum turning radius
2. maximum height clearance
3. maximum width clearance
4. road bearing capacity required for the transporter.

The entry, receipt, and transport of the spent/failed LAW melters within WTP must be considered within an operating nuclear facility. Therefore, the requirements of 2008 NQA-1 part II (with the NQA-1a-2009 Addenda) section 2.15, "Hoisting, Rigging and Transport for Nuclear Power Plants" and those sections referenced in section 2.15, are applicable and must be considered in the evaluation.

As noted above, the TOC must provide the transport system loading procedures and equipment descriptions for WTP Contractor review. The Subcontractor shall identify any unique aspects involved in the future development of the loading procedures and design/procurement of required equipment associated with compliance with the *Hanford Site Hoisting and Rigging Manual* (DOE/RL-92-36) and Washington River Protection Solutions (WRPS) Hoisting and Rigging procedures TFC-ENG-FAC SUP-C-25 and TFC-ESHQ-S-STD-28. The evaluation should look at the transportation system as a whole to develop the most efficient methodology and technologies at the loading interface. The Subcontractor shall identify schedule requirements for the construction of lifting equipment capable of meeting the lift requirements and any unique construction zone impacts to the area required for setup and on-going nuclear operations associated with melter transport.

If, after evaluating the interfaces at WTP and the IDF, the Subcontractor determines that alternative methods of loading/unloading in comparison to use of a crane appears feasible, the evaluation should discuss such alternatives, including the basis for considering the alternative suitable for melter loading/unloading.

Transporter and Transportation

As discussed above, the current technical basis for transporter design is the Goldhofer submarine reactor compartment transporter. The Subcontractor shall either validate the current technical basis or provide inputs that WRPS will consider relative to new

transporter requirements and equipment description. Alternatives for the most cost effective and efficient transporter should be considered.

The Subcontractor shall evaluate alternative transportation routes from the WTP to the IDF. The current condition of existing roadways and potential required upgrades vs. axle weight as it relates to transporter design should be considered. Requirements for the transporter, secured and protected loads, and transfer to the IDF must be in compliance with the *Hanford Sitewide Transportation Safety Document (TSD)*, DOE Order 460.1C, *Packaging and Transportation Safety*, and 49 CFR 173, *Shippers - General Requirements for Shipments and Packagings*. The evaluation of alternate transportation routes should conclude with a recommended route based on lowest cost impact, including consideration for condition of existing roadways and upgrades that may be required, road closures/interruptions to site operations, and compatibility and in concert with the transporter design and transportation regulations.

The evaluation shall include a listing of all transportation documentation and permits that may be applicable, DOT requirements/exemptions, and Hanford conduct of operations.

Void Fill Interface

As discussed above, the LAW melters may be required to be void filled prior to disposal. Void fill will not take place within the WTP. Therefore, consideration may be given to the lighter loads for transporting a spent/failed melter to a fill station, if transporter key parameters become limiting during part of the route. The Subcontractor shall bring any limiting key parameter to the attention of WRPS as soon as practical after identifying one.

Additionally, the transportation route evaluation should also include identification of preferred location(s) for a potential void fill station along the route.

The Subcontractor shall evaluate the impact of void filling the melter while on the transporter, including the effect of asymmetrical loading during void fill.

TOC/IDF Interface

The failed melter disposal area within the IDF and concept of operations for the receipt and interface with the IDF Contractor are defined in the IDF Operations and Maintenance Philosophy document. The proposed area for disposal is specifically shown on "IDF Phase 1 Waste Placement Plan," sheet 5E04 in Appendix 5E. The access ramp is discussed in Section 5.3.4. The access ramp at the bottom of the initial phase will have minimum outside turning radius of 75 feet to accommodate the transporter. Additional details on the access ramp can be found on IDF Cells 1 and 2 Subgrade Plan, H-2-830829, 5% grade; IDF Cells 1 and 2 Site Access Plan, H-2-830828, sheet 1, 1520 feet long; and IDF Site Access / Infiltration Area Civil Details, H-2-830828, sheet 2, 30 feet in width.

As noted above, the TOC must provide the transport system unloading procedures and equipment descriptions for IDF Contractor review. This evaluation should identify any unique aspects involved in the future development of the unloading procedures and design/procurement of required equipment associated with compliance with the *Hanford Site Hoisting and Rigging Manual* (DOE/RL-92-36) and Washington River Protection Solutions (WRPS) Hoisting and Rigging procedures TFC-ENG-FAC SUP-C-25 and TFC-

ESHQ-S-STD-28. The evaluation should look at the transportation system as a whole to develop the most efficient methodology and technologies at the unloading interface. The Subcontractor shall identify schedule requirements for the construction of lifting equipment capable of meeting the lift requirements and any unique construction zone impacts to the area required for setup and on-going nuclear operations associated with melter transport.

Consideration should be given to the location of the proposed melter disposal unloading point within the IDF itself; the magnitude of the lifting equipment capable of meeting the lift requirements, including a void filled melter weighing up to 500 tons; the transport of the lifting device pieces down and around the access ramp and the size of the construction zone that will be required for in-pit assembly/disassembly and removal; scheduling impacts and interference with operations during the importation and removal of the lifting device and construction zone; and the extent of the hoisting device clearance zone and potential impacts on other planned operations within Cell 1. An alternative receiving/holding area that could also be utilized as a void filling site at the IDF is conceivable and may be considered.

One additional restriction must be considered in the evaluation of IDF interface. A limit on the weight of equipment allowed within the Cell 1 and Cell 2 footprints has been established to protect the liner systems and meet permit requirements. Per IDF-311-1.5, Entry Control, the maximum allowable ground pressure weight limit is 13,000 pounds per square foot.

At some future point in time, it may be that a single contractor may operate the WTP, TOC and the IDF. When evaluating the efficiencies at the WTP/TOC and TOC/IDF interfaces, any efficiencies associated with a single contractor performing the loading, transport and unloading should be documented in the report.

Melter Contamination

The potential exists that the melter may have plastic wrap or equivalent to prevent the spread of contamination. The evaluation shall address any unique aspects to transporter design, operations, loading or unloading that may result from such contamination control. In addition, the evaluation shall discuss possible methods to decontaminate the transporter should it become contaminated.

4.0 Submittals and Schedule

In support of the work scope established in Section 3.0 above, submittals are listed on the Master Submittal Register (MSR).

Submittals shall be provided using the TOC Incoming Letter of Transmittal (form A-6005-315). All transmittal subject headings shall contain, at a minimum, the subcontract number, submittal number, and submittal description.

Submittals shall be provided in electronic format unless available only as a hard copy. Electronic submittals may be sent to TOCVND@rl.gov or delivered via a WRPS designated File Transfer Protocol (FTP) site. Electronic formats must be non-password protected in one of the following formats:

- Microsoft® Office Compatible
- Moving Picture Expert Group

- Portable Document Format (PDF)
- Tagged Image File Format (TIFF)
- Graphics Interchange Format (GIF)
- Joint Photographic Experts Group (JPEG)
- Windows Media Video (WMV)
- Extensible Markup Language (XML)
- HyperText Markup Language (HTML)
- Comma Separated Values (CSV)
- Text (TXT)

5.0 Acceptance Criteria

Work products and services provided must meet WRPS procedures or equivalent Subcontractor standards for control and review of work products: TFC-ENG-DESIGN-C-25, *Technical Document Control*, and TFC-BSM-AD-STD-02, *Editorial Standards for Technical Documents*. Calculations (if any) shall comply with TFC-ENG-DESIGN-C-10, *Engineering Calculations*. Acceptance shall be based on validation by WRPS that subcontractor has resolved and incorporated all WRPS comments.

6.0 Configuration Management and Standards

6.1 Configuration Management Requirements

Draft deliverables issued for WRPS review shall be labeled as such, dated, and controlled to the extent that subsequent changes can be identified.

6.2 Applicable Standards and Procedures

The following table provides the engineering codes, procedures, and standards that are applicable to this SOW. Unless otherwise specified, the latest version of each code, procedure, and standard shall be used.

	Number	Title
1*	2008 NQA-1 (with 2009 Addenda), Part II section 2.15	<i>Hoisting, Rigging and Transport for Nuclear Power Plants</i>
2*	DOE/RL-92-36	<i>Hanford Site Hoisting and Rigging Manual</i>
3*	TFC-ENG-FAC SUP-C-25	<i>Hoisting and Rigging</i>
4*	TFC-ESHQ-S-STD-28	<i>Hoisting and Rigging Safety</i>
5	DOE/RL-2001-36	<i>Hanford Sitewide Transportation Safety Document</i>
6	DOE Order 460.1C	<i>Packaging and Transportation Safety</i>
	10 CFR Part 71	<i>Packaging and Transportation of Radioactive Material</i>
7	49 CFR 173	<i>Shippers – General Requirements for Shipments and Packagings</i>
8	<i>TFC-ENG-DESIGN-C-25</i>	<i>Technical Document Control</i>
9	<i>TFC-BSM-AD-STD-02</i>	<i>Editorial Standards for Technical Documents</i>
10	<i>TFC-ENG-DESIGN-C-10</i>	<i>Engineering Calculations</i>

*Note: Hanford site policies and procedures for hoisting and rigging are undergoing review and revision in order to comply with NQA-1-2008, and the NQA-1b-2009 Addenda. As a consequence, with regards to the table above, in case of conflict between procedures marked with an asterisk, NQA-1b-2009 Addenda, Part II, section 2.15 shall take precedence.

Although the intent is to list all applicable documents in the above table, the Subcontractor shall be required to invoke and comply with any procedures, codes, and/or standards embedded in this SOW.

7.0 ESH&Q Requirements

7.1 Quality Assurance Requirements

The Subcontractor shall have implemented a Quality Assurance Program that meets the following specific requirements:

REQUIREMENT 1, Organization

Responsibilities for the establishment and implementation of the quality assurance program shall be defined. The organizational structure, functional responsibilities, levels of authority, and lines of communications for activities affecting quality shall be documented.

REQUIREMENT 2, Quality Assurance Program

(a) A documented quality assurance program shall be planned, implemented, and maintained in accordance with this list of requirements. The program shall identify the activities and items to which it applies.

The program shall provide control over activities affecting quality to an extent consistent with their importance. The program shall include monitoring activities against acceptance criteria in a manner sufficient to provide assurance that the activities affecting quality are performed satisfactorily. The program shall be established at the earliest time consistent with the schedule for accomplishing the activities. The program shall provide for the planning and accomplishment of activities affecting quality under suitably controlled conditions. Controlled conditions include the use of appropriate equipment, suitable environmental conditions for accomplishing the activity, and assurance that prerequisites for the given activity have been satisfied. The program shall provide for any special controls, processes, test equipment, tools, and skills to attain the required quality of activities and items and for verification of that quality. The organization shall establish and implement processes to detect and correct quality problems.

(b) The program shall provide for indoctrination, training, and qualification as necessary of personnel performing or managing activities affecting quality to ensure that suitable proficiency is achieved and maintained.

(c) Management shall regularly assess the adequacy and effective implementation of the quality assurance program.

REQUIREMENT 5, Instructions, Procedures, and Drawings

Activities affecting quality and services shall be prescribed by and performed in accordance with documented instructions, procedures, or drawings that include or reference appropriate quantitative or qualitative acceptance criteria for determining that prescribed results have been satisfactorily attained. The activity shall be described to a

level of detail commensurate with the complexity of the activity and the need to assure consistent and acceptable results. The need for, and level of detail in, written procedures or instructions shall be determined based upon complexity of the task, the significance of the item or activity, work environment, and worker proficiency and capability (education, training, experience).

REQUIREMENT 6, Document Control

The preparation, issue, and change of documents that specify quality requirements or prescribe activities affecting quality such as instructions, procedures, and drawings shall be controlled to ensure that correct documents are being employed. Such documents, including changes thereto, shall be reviewed for adequacy and approved for release by authorized personnel.

REQUIREMENT 16, Corrective Action

Conditions adverse to quality shall be identified promptly and corrected as soon as practicable. In the case of a significant condition adverse to quality, the cause of the condition shall be determined and corrective action taken to preclude recurrence. The identification, cause, and corrective action for significant conditions adverse to quality shall be documented and reported to appropriate levels of management. Completion of corrective actions shall be verified.

REQUIREMENT 17, Quality Assurance Records

Quality assurance records shall furnish documentary evidence that items or activities meet specified quality requirements. Quality assurance records shall be identified, generated, authenticated, and maintained, and their final disposition specified. Requirements and responsibilities for these activities shall be documented. The term records is to be interpreted as quality assurance records.

7.2 Price-Anderson Amendments Act Requirements

This 7.2 section and the General Provisions Article 2.11 entitled, Price-Anderson Amendments Act (PAAA), are both determined to be N/A.

7.3 Special ESH&Q Requirements

Unescorted Hanford Site access is not authorized for work to be completed under this SOW.

Preliminary hazard assessment PHA ID: 31 is to be used for general office duties performed in TOC-controlled office facilities only. Prior to performing any activities outside of the office facility, a job hazard analysis (JHA) must be completed to cover the activities to be performed. The JHA must be approved by a TOC Safety Representative.

8.0 Verification/Hold Points

There are no verification/hold points associated with this SOW. The schedule and submittals in response to WRPS comments is outlined in Section 4.0.

9.0 Reserved

10.0 Work Location/Potential Access Requirements

Subcontractor shall perform this scope at their corporate offices, with periodic visits to WRPS Richland offices for meetings and discussions or site visits. No routine access to badged areas is required. Personnel visiting Richland offices must be United States citizens and have photo identification to obtain a temporary visiting pass.

11.0 Training

There is no specific training required for this scope.

12.0 Qualifications

Key technical personnel conducting this evaluation should be familiar with the *Hanford Site Hoisting and Rigging Manual* (DOE/RL-92-36), the *Hanford Sitewide Transportation Safety Document (TSD)*, DOE Order 460.1C, *Packaging and Transportation Safety*, and 49 CFR 173, *Shippers - General Requirements for Shipments and Packagings* and, preferably, 2008 NQA-1 part II section 2.15, "*Hoisting, Rigging and Transport for Nuclear Power Plants*" and those sections referenced in section 2.15 which are applicable. The Lead should have extensive experience with Hanford heavy lifts and transportation.

13.0 Special Requirements

Use of Government Vehicles

There is no anticipated need for any Subcontractor employees to use a Government-furnished vehicle in the performance of this statement of work. The Subcontractor's employees, therefore, are specifically prohibited from driving any Government-furnished vehicles under the performance of this statement of work unless this statement of work is formally so modified by the parties and a copy of any applicable driver's license provided to the BTR.

Non-Disclosure Agreement

The One System Non-Disclosure (NDA) is required to facilitate document sharing and information exchange between WTP/ Bechtel National Inc. and TOC/WRPS. Any Subcontractor personnel using WTP documents during the performance of this work must complete the NDA prior to accessing WTP documents.

14.0 Reporting/Administration

There are no specific reporting or administration requirements associated with this SOW. The schedule and submittals in response to WRPS comments is outlined in Section 4.0.

15.0 Workplace Substance Abuse Program Requirements

A Workplace Substance Abuse Program is not required for this SOW.